

# Implementation of CWA 316(b) in New York

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# NY delegated NPDES program in 1975

- In NY, 316 implemented as a water quality standard.
- Department of Environmental Conservation includes Divisions of Water (water quality issues) and Fish, Wildlife, and Marine Resources (CWA 316) work cooperatively to issue permits

# Accomplished a lot – Things that helped:

- A long history of NY caring about the natural environment;
- The legacy of US EPA's efforts in the Hudson River Power Case;
- An engaged environmental community;
- Department support for the steam-electric program.

# Before getting started

- Define: Adverse environmental impact (any death or damage is adverse; the relevant question is what is a reasonable requirement to reduce or eliminate the impact?)
- Use Best Technology Available: an empty promise if no one is working to advance the state-of-the-art. Made a commitment; got lots of help! (Thanks.)

# Today's mission

- Provide an overview of the technologies that we have applied in NY.

# 316(a): Low-tech solution



Screen Washing = Plastic and..



# “Debris elevator”





# Enter CWA



# Lots of Debris and Fish



# Lake Trout Anyone?



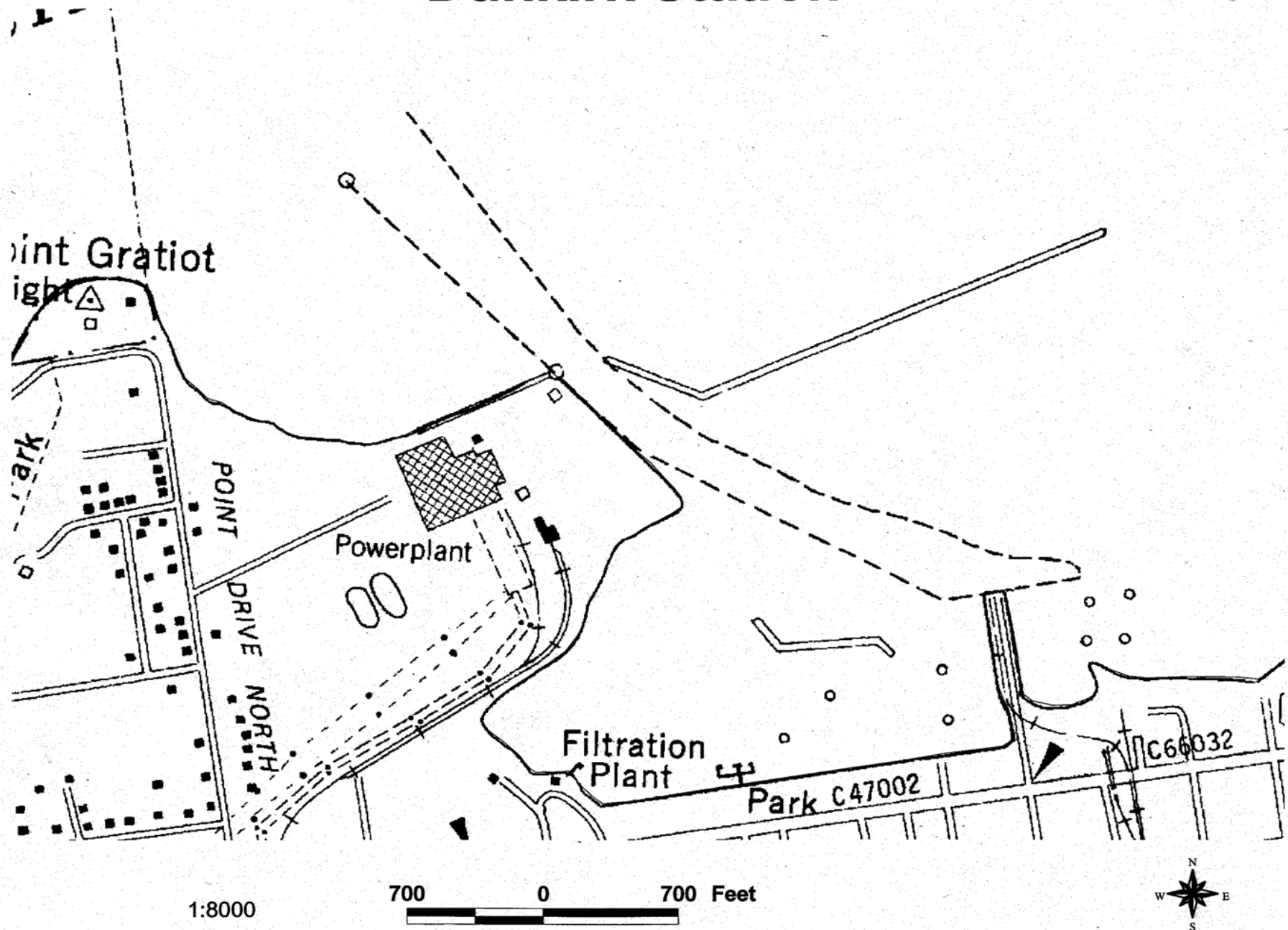
# Fish Return via Micky D's

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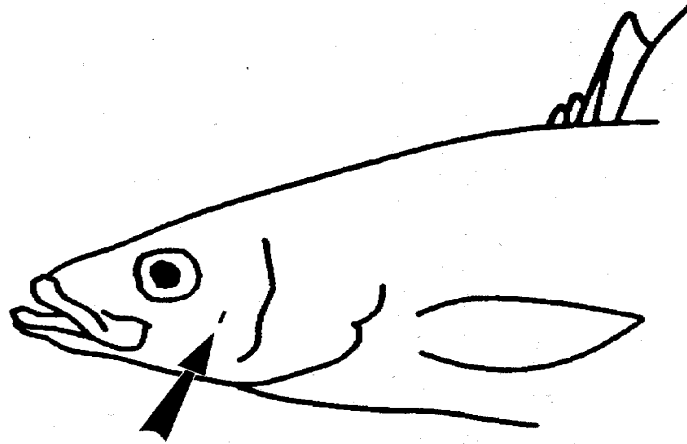
# Dunkirk Station



# Directional Drilling Equipment



# Locating a fish return



**TAG PLACEMENT**

# Stocking Hatchery Fish





# Magnetic Tag Detector



# I P Screen-Wash Mock-up



# I P Mock-up Fish Wash

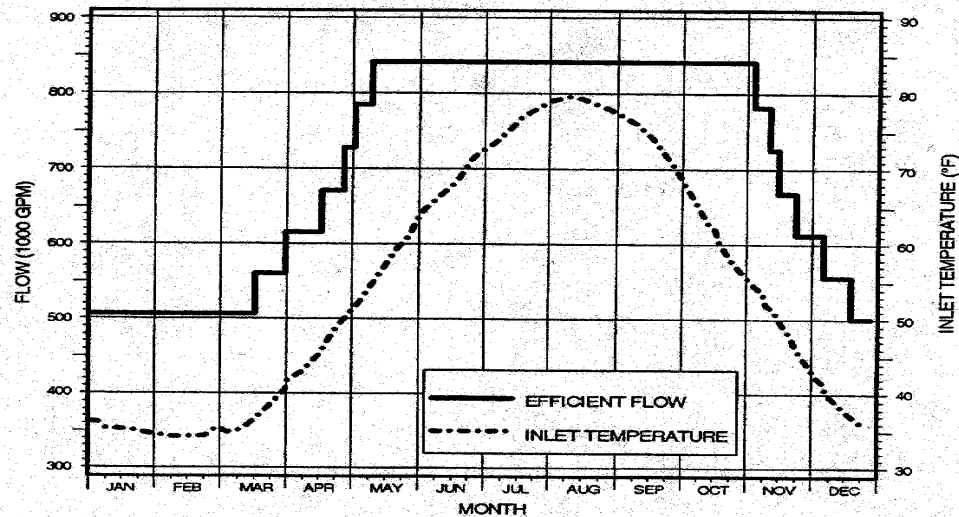




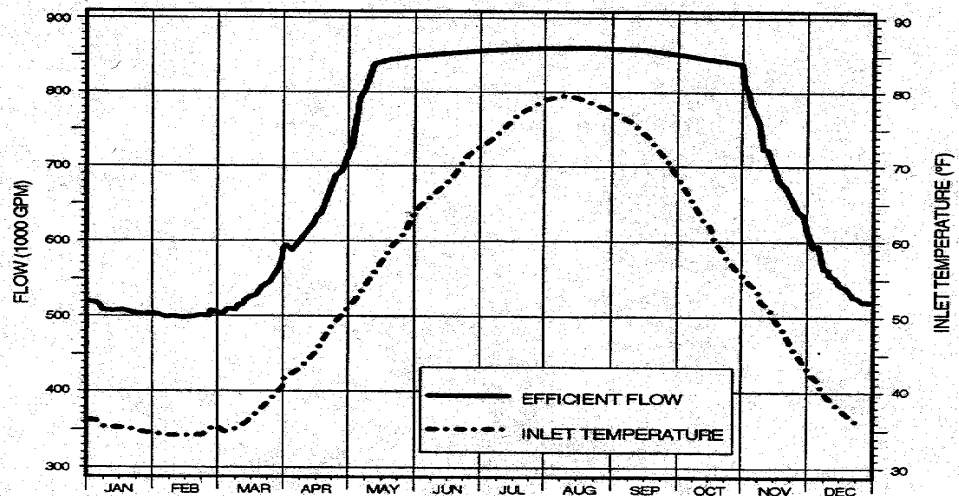
# Release of Entrained Air



# Cooling Water Flow Modulation



INDIAN POINT UNIT 2



INDIAN POINT UNIT 3

# Winter Flow Reduction Study

TABLE 3.6.1-1

THE FIVE MOST ABUNDANTLY IMPINGED SPECIES DURING  
WINTER OPERATION AT SOMERSET STATION

	<u>1984-85</u>	<u>1985-86</u>	<u>1986-87</u>	<u>1987-88</u>
<b>Total</b>	70,825	88,994	285,360	13,461
Rainbow Smelt	20,519(1)*	27,069(1)	25,322(3)	5,796(1)
Alewife	4,795(4)	3,379(5)	26,850(2)	539
Spottail Shiner	9,545(3)	19,712(3)	10,329(5)	3,282(2)
White Bass	4,755(5)	24,290(2)	13,788(4)	330
Gizzard Shad	699	4,186(4)	196,383(1)	254
White Perch	13,771(2)	3,551	7,671	1,125(3)
Rock Bass	1,850	2,288	616	465
Mottled Sculpin	1,144	926	1,467	1,011(4)
Lake Chub	1,496	803	952	770(5)

# A Tale of Two Screens

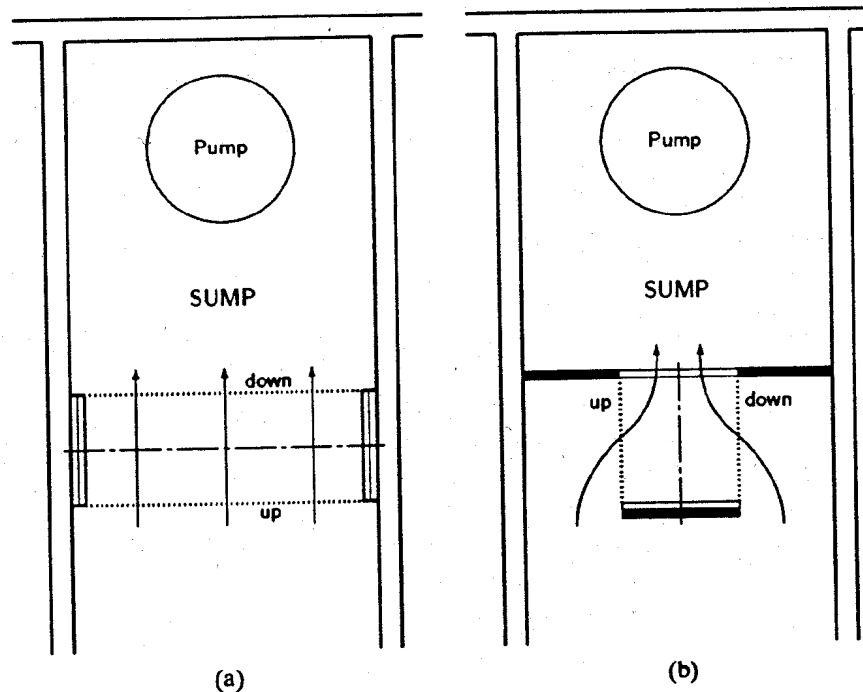


FIGURE 2.—(a) Plan of a typical intake channel equipped with a conventional rotating screen (as in Fig. 1). (b) Conversion of the intake bay to a double-entry, single-exit rotating screen.

# Dual Flow Screen Hydraulics





# Dual Flow Velocity Profiles

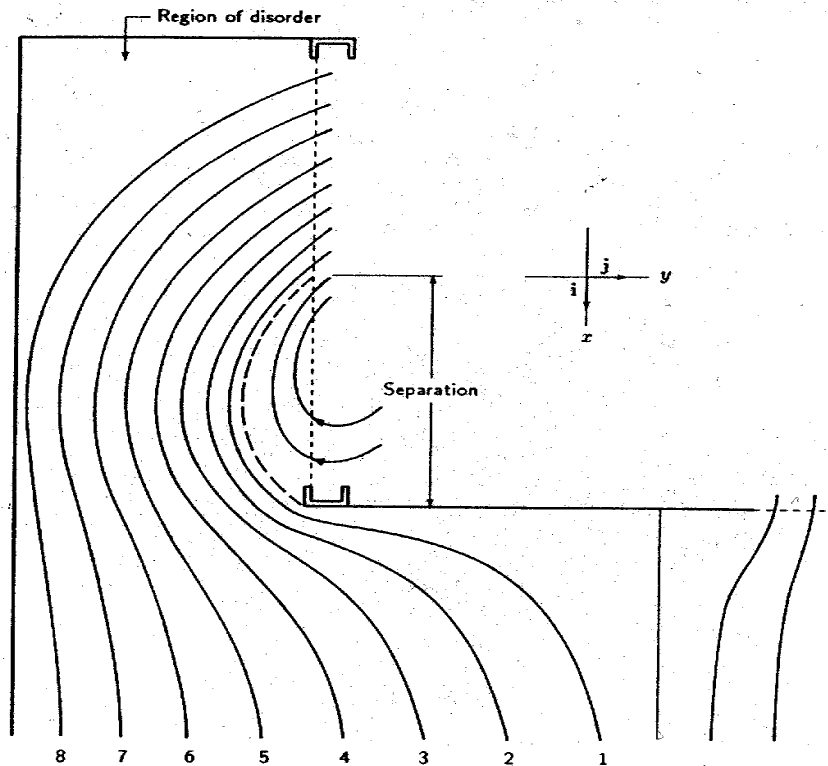
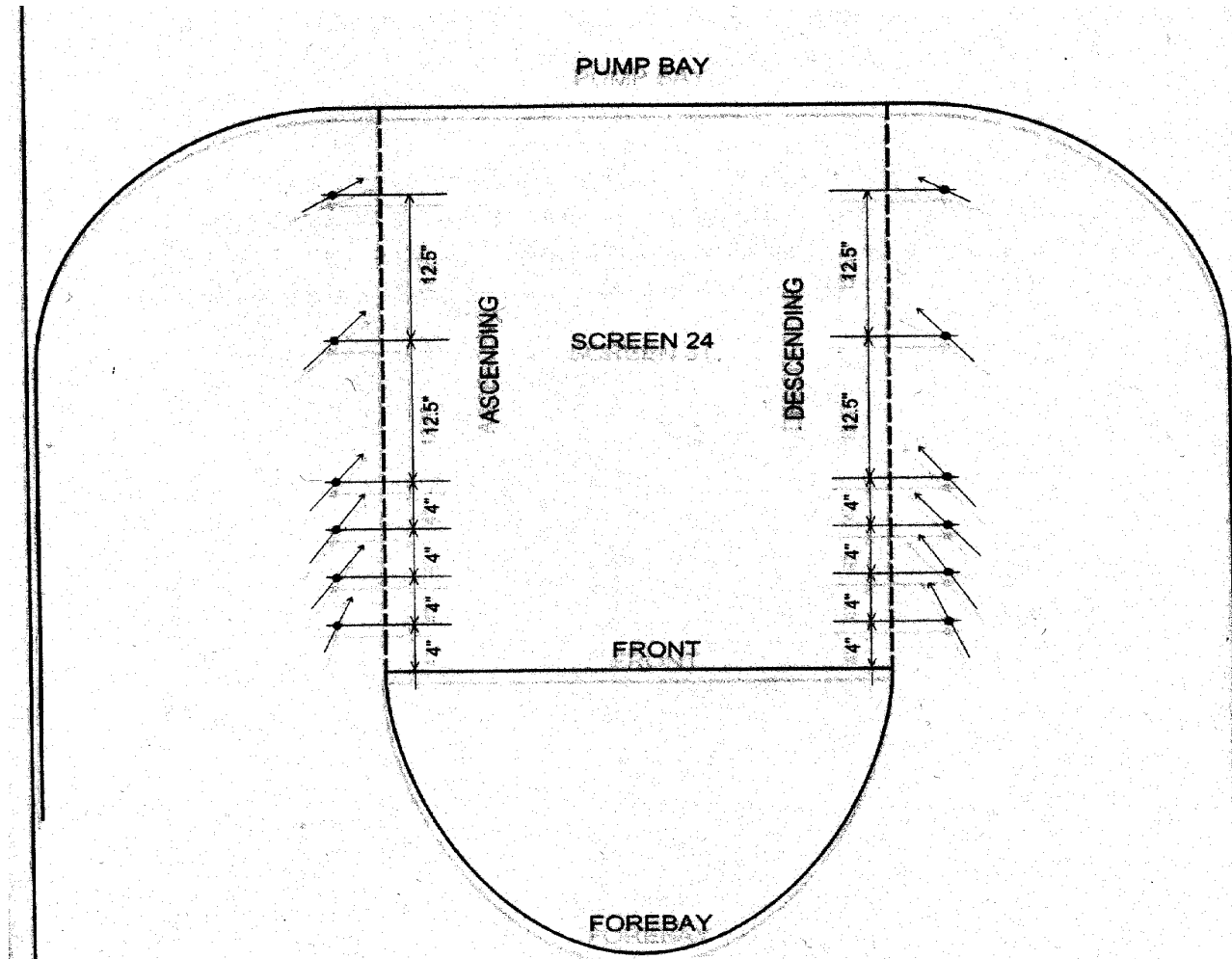


FIGURE 12.—Plot of equal-valued transport trajectories, 45-cm/s setting. Each trajectory represents a volume transport of  $\sim 956 \text{ cm}^2/\text{s}$  per cm of depth. The corner separation extended to 50% of the screen width at the 45-cm/s setting and 38% at the 30-cm/s setting.

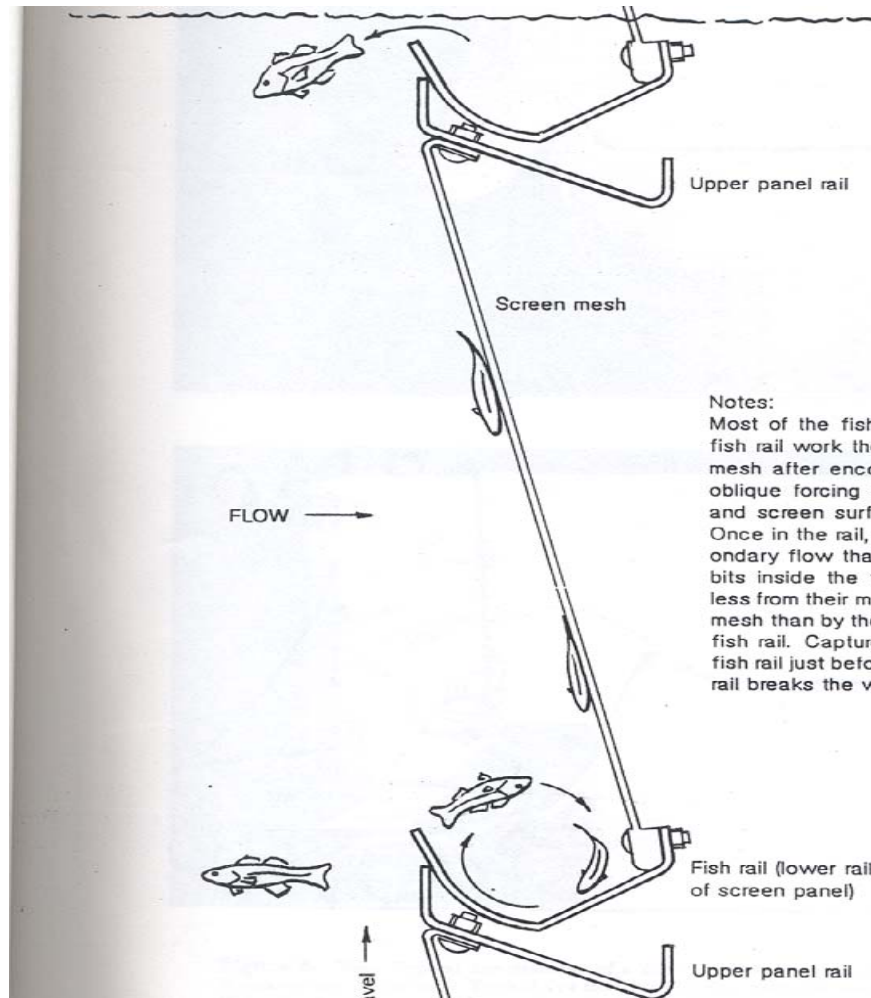
# Reordering Flow: Phase 1



# Reordering Flow: Phase 2



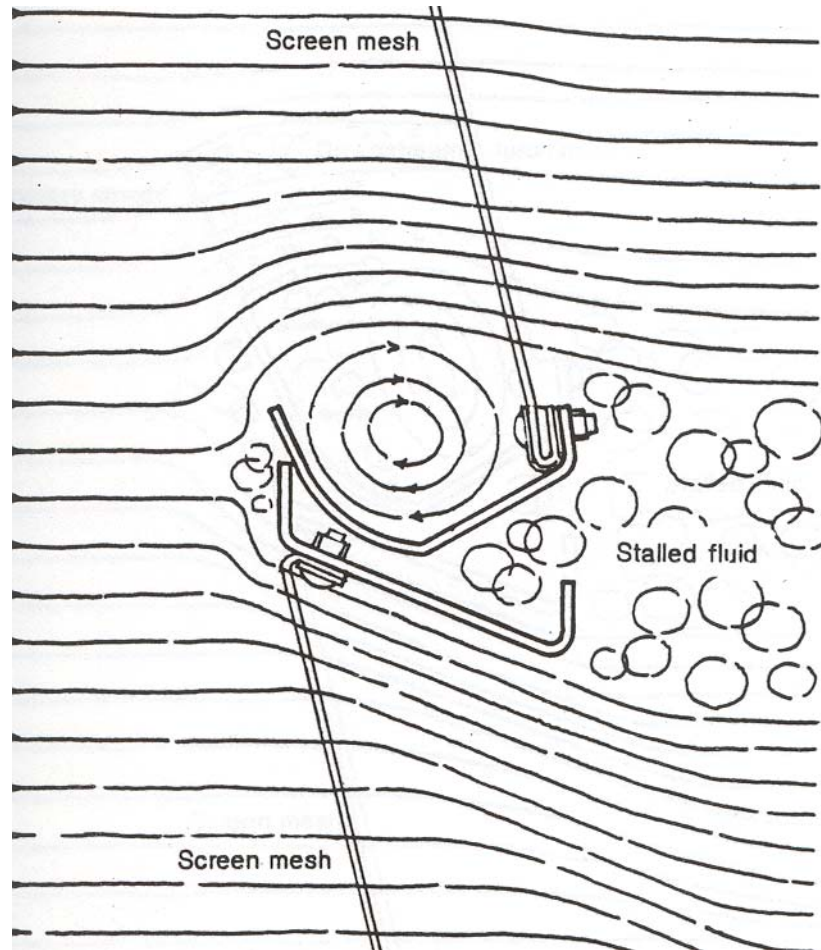
# Ristroph Screen Fish Rail



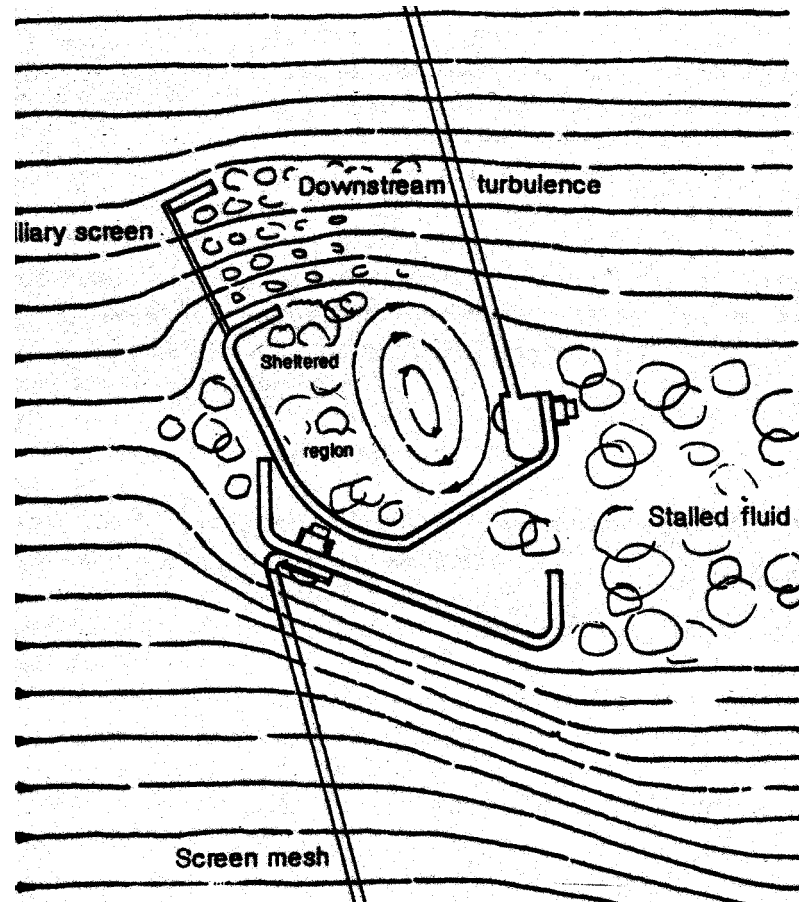
## Notes:

Most of the fish that enter the standard fish rail work their way down the screen mesh after encountering the screen; the oblique forcing angle between the flow and screen surface aids that movement. Once in the rail, fish are caught in a secondary flow that swirls them in rapid orbits inside the fish rail. Fish are injured less from their movement down the screen mesh than by the buffeting received in the fish rail. Captured fish often escape the fish rail just before the leading edge of the rail breaks the water surface.

# Fish Rail Hydraulics

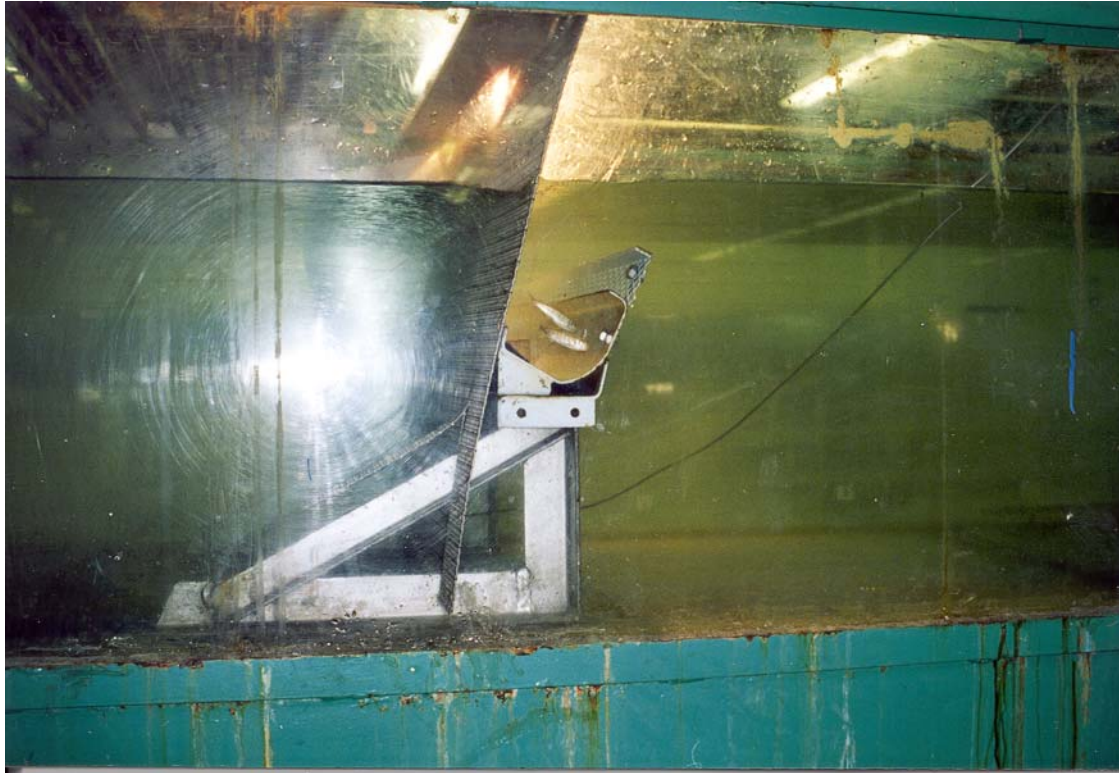


# Modified Fish Rail





# Utah State Fish Rail Mod

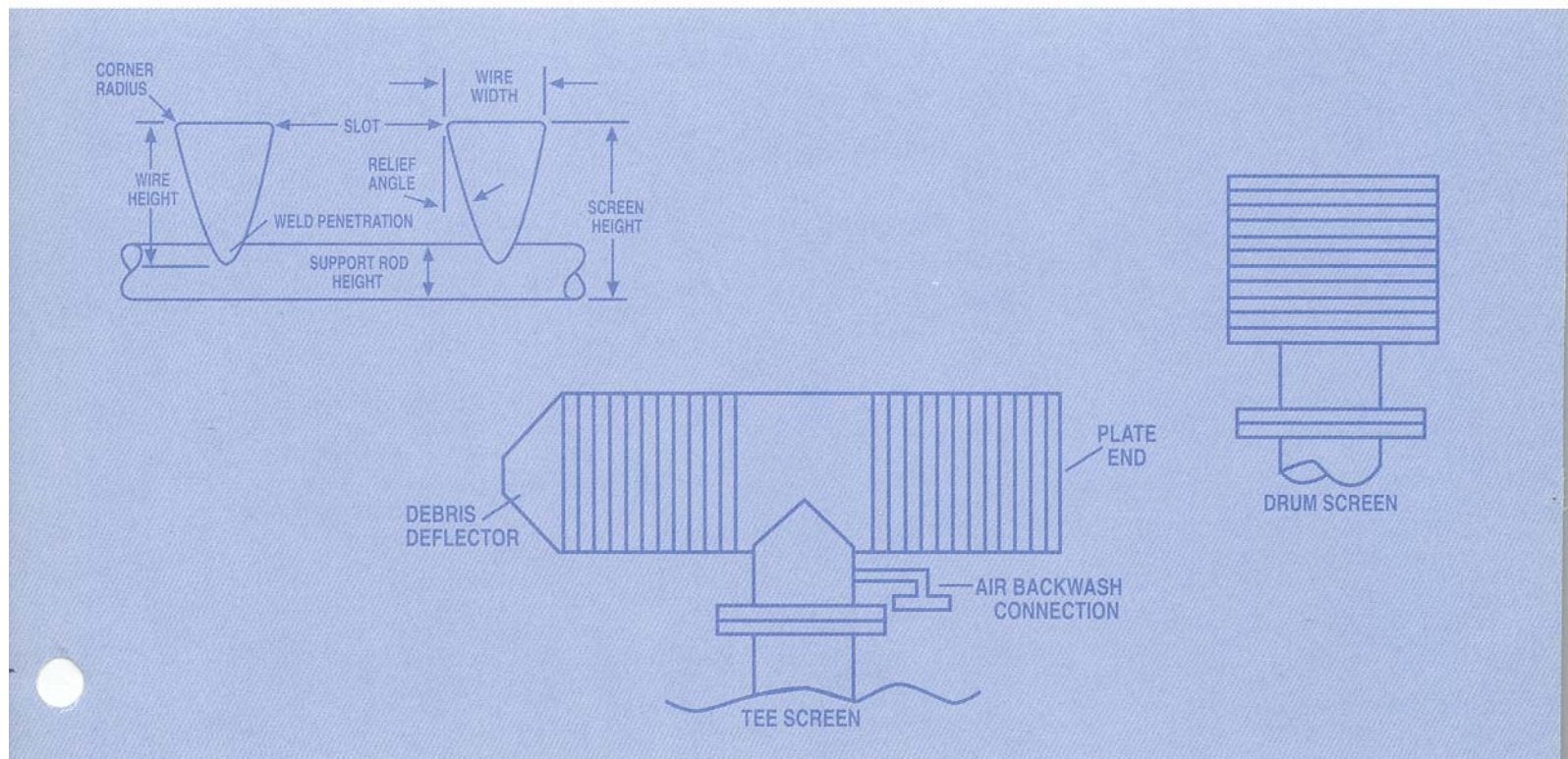


# Wedge-wire Screen

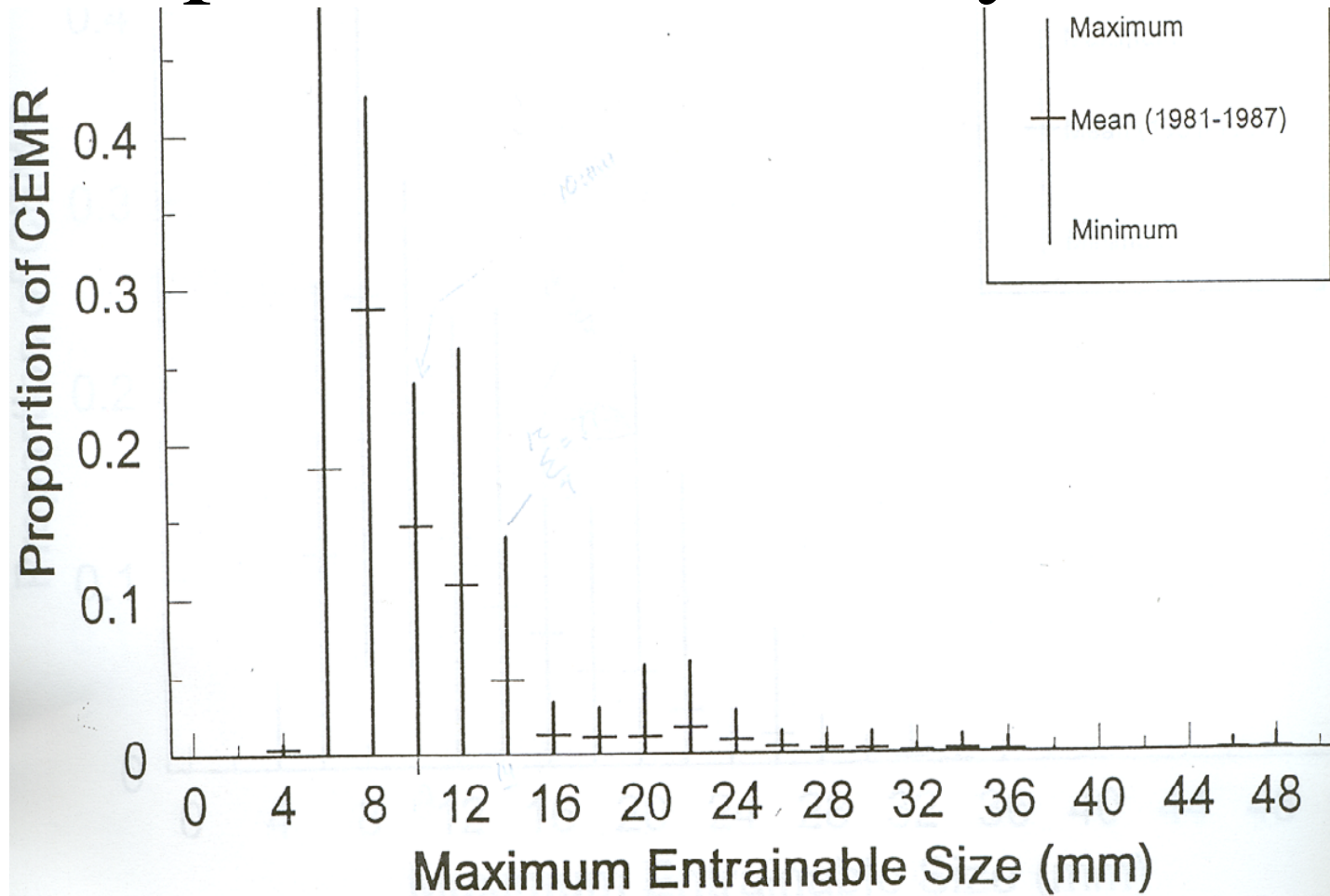




# Wedge-wire Screen Detail



# Striped bass CEMR by Size

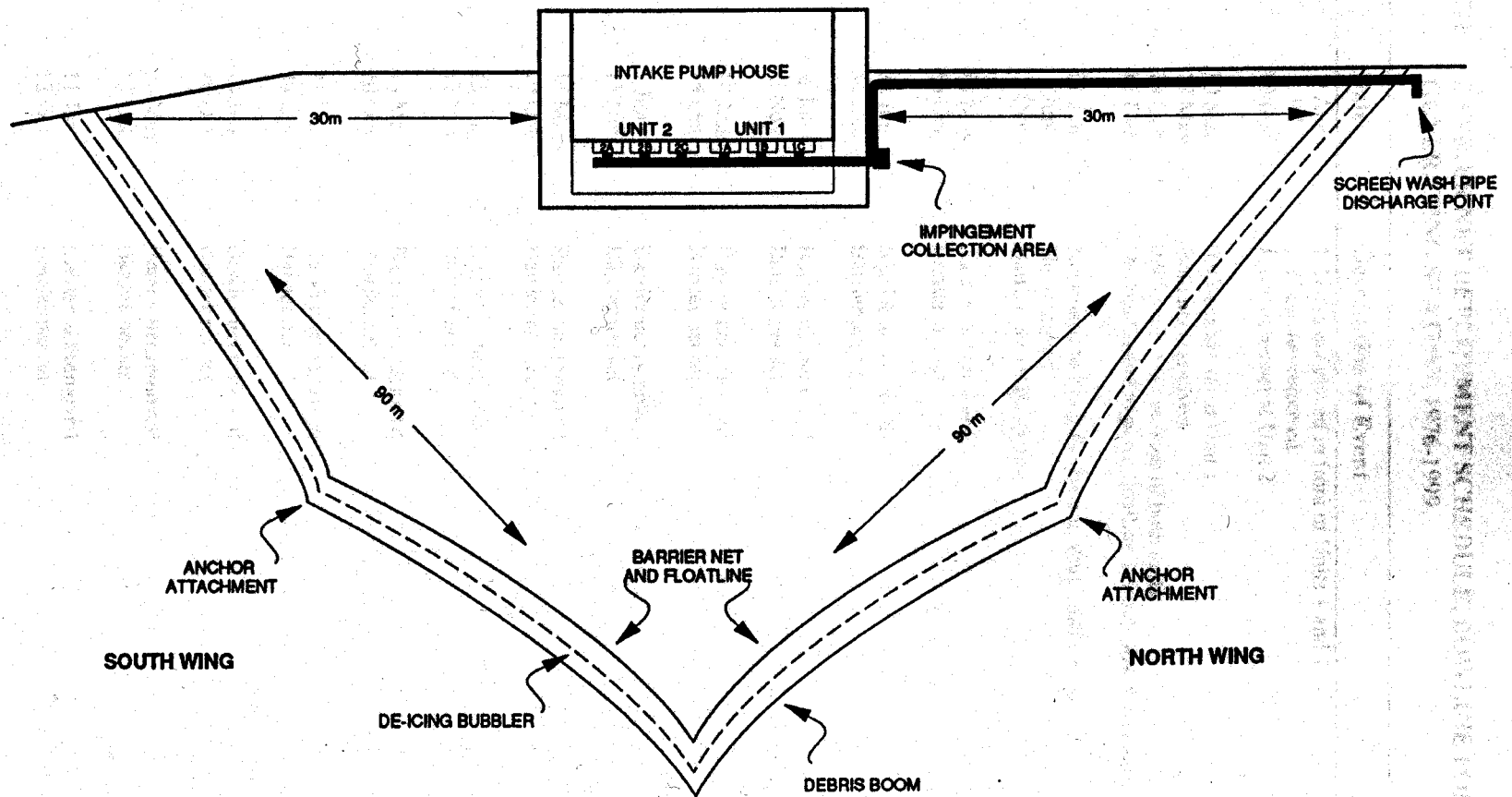


# Bowline Barrier Net



**Bowline Point Generating Station**

# Bowline Barrier Net Detail



7-1. Bowline Point barrier net. (Distances are approximate).

# Bowline Impingement

Estimated Impingement Abundance

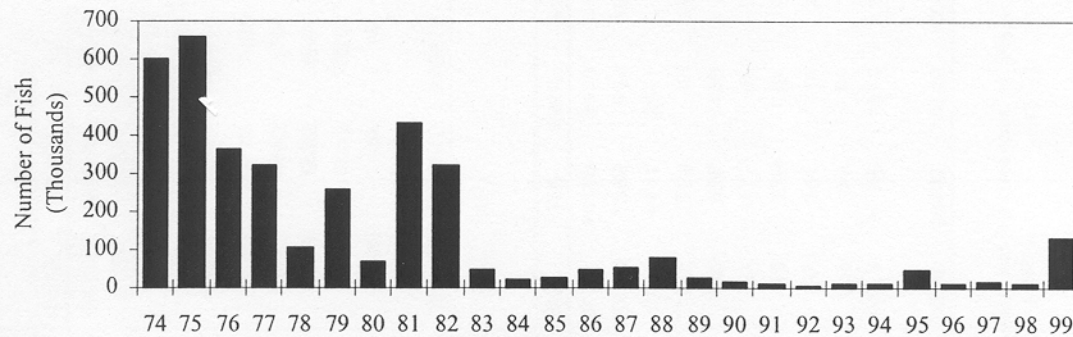
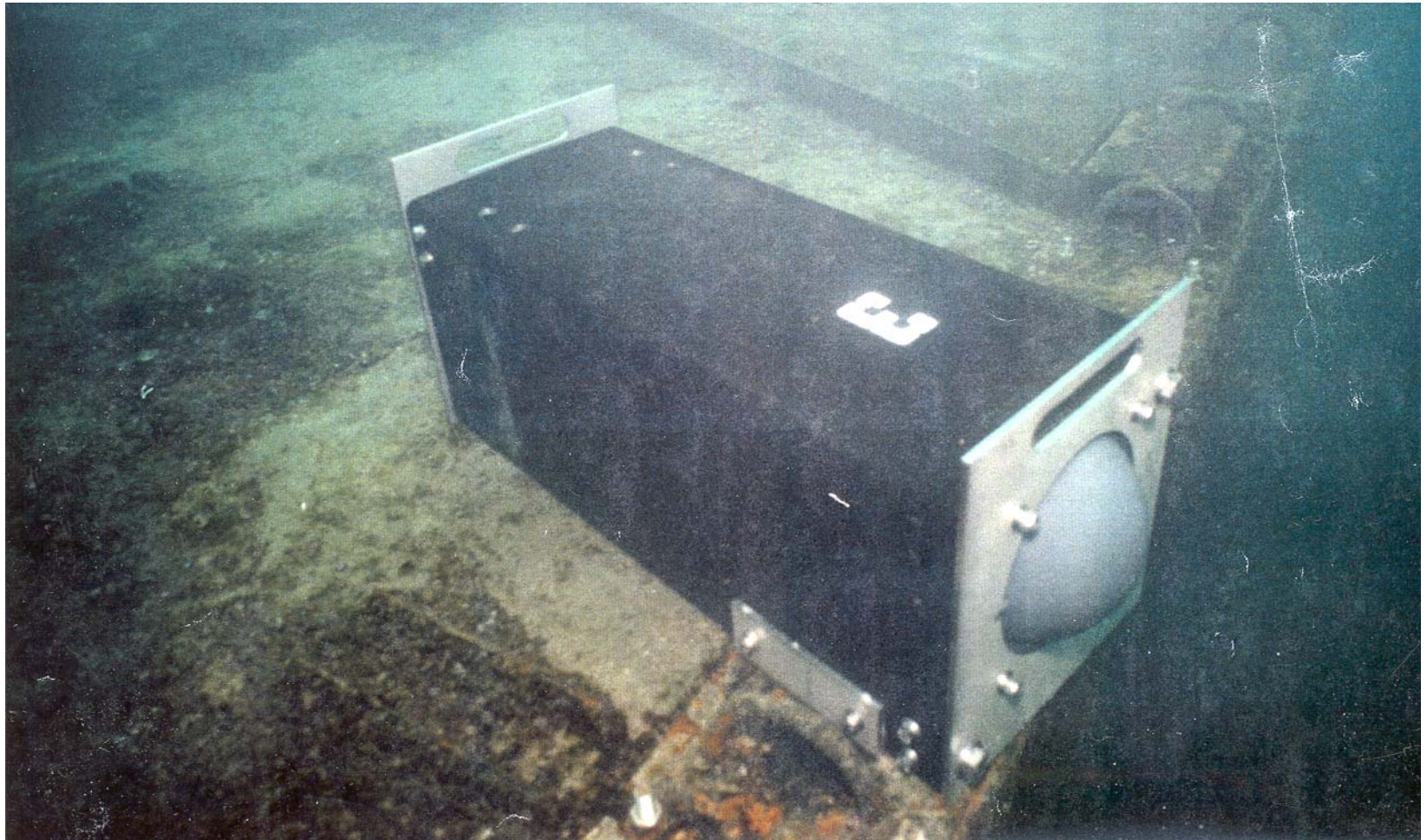


Figure 6-2. Annual plant flow, impingement rate, and estimated impingement abundance at Bowline Point Generating Station, 1974-1999.



# Fish Startle System / IPA



# Gunderboom MLES



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